B2 cont'd

during the different steps of postprocessing, which means that energy management in drying is an extremely vital factor contributing to the profitability of production. Correct drying technique also affects the quality of the produced paper grade. Another parameter highly pertinent to the quality of produced paper is the control of the machine-direction moisture profile, that is, the moisture of the base paper, which must be kept at a constant level during the run. The web moisture content affects particularly the paper web behavior in calendering and printing. As modern production lines are equipped with on-line calendering, wherein the coated web is passed directly to a calender, the moisture profile of the running web has an insufficient time to reach a uniform equilibrium state prior to calendering, a situation which is in contrast to that attainable in the traditional off-line calendering, wherein the coated web was stored in a machine reel prior to subsequent calendering. Correspondingly, the transport chain of paper from the mill to printing houses and other users has been speeded up, whereby the moisture even in uncalendered paper does not necessarily have enough time to stabilize and reach a sufficiently low level prior to printing. In coating, the web moisture content affects the penetration of water into the base web during the application of the coating mix and, as a result, the change of coating solids content after coating. As variations in the solids content of the coating are reflected in plural parameters in the application process, it is important to keep the web moisture during application and drying accurately within proper limit values in order to attain a uniform and desired final quality of the product.--

Page 5, replace the paragraph beginning on line 14 with the following paragraph:

B3

--By virtue of the model according to the invention, it is possible to directly compute the moisture content of the web at the outgoing side of each dryer, provided that the specific evaporation rate at the dryer and the web moisture at the ingoing side are known. After the chaining of the individual submodels, the web moisture content can be computed at different points along the coater section, the most important parameter value obviously being the final moisture content of the web. With the help of the model, the dryer effects may be adjusted according to the individual properties so that the characteristics of different types of dryers are optimally taken into account. Since infrared dryers feature a quick response, they may be

B3 cont'd

used, e.g., during run-up for controlling the overall effect of the dryer group, thus allowing the evaporation effect levels of other dryers to be elevated in a more relaxed manner to their steady-state values during the normal run by way of compensating for the delay of dryer warm-up with the help of delay terms adapted into the model. The use of delay terms also makes it possible to manage actual process response delays.--

Page 8, replace the paragraph beginning on line 3 with the following paragraph:

B4

--Next downstream to the coater station 1 are located first an infrared radiant dryer 2, then three air-impingement dryers 3 to 5 and finally a dryer cylinder group 6 comprising a plurality of dryer cylinders 7. On the dryer cylinder group 6, the web 8 is dried to a moisture suitable for final calendering and next the web 8 is passed via a moisture content gauge 9 to the upwinder 10.--

Page 10, replace the paragraph beginning on line 31 with the following paragraph:

B5

--The method can be applied to both so-called off-machine and on-machine coater sections, and it is capable of performing dryer control functions under a normal steady-state production run situation as well as during dynamic transition phases toward a normal production run state. In the context of the present invention, a normal steady-state production run situation is understood to refer to a condition in which no changes occur in the machine speed or, if changes do occur, they are of a type that will not be reflected in the product quality. Such change and transition situation(s) is/are represented by changes in machine speed and start-up of section operation. The measurements values of the process quality monitoring system and other values such as the web moisture, basis weight, coat weight, coat solids content and web temperature sensor signals obtained from the coater section control system serve as the input signals of the method. The measurement sensors of the process quality monitoring system may be located either after the last dryer unit in each coater station and preceding the upwinder, whereby the measurement system represents a comprehensive implementation or a portion of the so-called intermediate points of moisture measurement can be omitted, whereby the method may use the web moisture estimates which are computed from the evaporation model and bear

B5 cont'd

an accurate relationship with the actual situation along the web travel, particularly when the parameters of the modeling equation are updated in real time.--

Page 16, replace the paragraph beginning on line 21 with the following paragraph:

B6

--In a normal steady-state production run situation involving no change in web speed, a feedback-type control scheme is used, whereby the model input signals formed by the web moisture set value and the actual web moisture measurement information are processed into a feedback signal of moisture error, on the basis of which signal the control algorithm then performs required changes to an extent defined by the system operator in the drying effects of dryers selected to be controlled by the control computer. While all the dryers may be set to be controlled by a computer or, respectively, set for manual control, in the spirit of the invention the drying effect of at least one dryer must be steerable by means of a model running on a computer. Herein, as shown in FIG. 2, either the intermediate point moisture sensor 12 or the process quality monitoring system sensor 9 preceding the upwinder 10 give the actual web moisture content value that is compared by the control program with the set value. On the basis of the difference between the set value and actually measured web moisture, the system computes the respective change of the overall moisture (ΔH_2O) that should be accomplished by means of the dryers selected to be steered by the control computer. If the moisture difference signal has a positive sign, the specific evaporation rate must be increased. Respectively, a negative sign indicates a need for reduced specific evaporation rate. The overall value of required moisture change (ΔH_2O) is divided between the dryers ($i = 1 - N$) selected to be steered under computer control using such proportional percentage weight factors (0 - 100 %) that the sum of the weighting factors always is 100 %. Obviously, other weighting strategies are also possible in the division of moisture change, that is, to implement the required change in the distribution of the drying effect between the dryers. For instance, the weighting factors may be selected to be proportional to the available evaporation rate capacities on the modeled dryers or to the desired moisture values at the intermediate points. In this kind of proportional division, each of the selected dryers is allocated to handle so much of the overall moisture difference control task as is indicated by its weighting factor. The specific evaporation rate